CLAIMS

What we claim is:

1. A method for increasing plasma viscosity in a mammal, comprising administering to said mammal an approved pharmaceutically acceptable non-oxygen-carrying viscosity increasing agent in an amount sufficient to increase peripheral viscosity by at least 1.0 cp.

2. The method of claim 1, wherein the increase in plasma viscosity is at least 2.0 cp.

3. The method of claim 1, wherein said mammal is a human.

4. The method of claim 1, wherein administration of said viscosity-increasing agent delays or eliminates the need for a blood transfusion.

5. The method of claim 1, wherein, either prior to or following administration of said viscosity-increasing agent, the hematocrit of said mammal is reduced by at least 50% from normal for the mammalian species.

6. The method of claim 1, wherein, either prior to or following administration of said viscosity-increasing agent, the hematocrit of said mammal is reduced by at least 50% from normal for the individual mammal.

7. A method for maintaining capillary blood flow in a mammal, comprising increasing plasma viscosity by administering to said mammal an approved pharmaceutically acceptable non-oxygen-carrying viscosity-increasing agent in an amount sufficient to increase plasma viscosity by at least 1.0 cp.

8. The method of claim 7, wherein said mammal is a human.

9. The method of claim 7, wherein said increase in plasma viscosity results in an increase in peripheral blood flow of at least 25%.

10. The method of claim 7, wherein, either prior to or following the administration of said viscosity-increasing agent, the hematocrit of said mammal is decreased by at least 50%.

11. A method for shifting the transfusion threshold in a patient, comprising administering to a patient suffering from a reduction in red blood cell concentration a pharmaceutically acceptable viscosity increasing agent in an amount sufficient to increase or maintain functional capillary density at least 60% of normal or to increase plasma viscosity at least 25% or both.

12. A method for treating a patient suffering or at risk of a condition characterized by a reduction in peripheral blood flow, comprising administering to said patient a pharmaceutically acceptable viscosity increasing agent.

13. A method for enhancing or maintaining the release of vasodilators and shear stress dependent vasodilators in the system of microscopic blood vessels of a mammal, comprising administering to said mammal a pharmaceutically acceptable non-oxygen-carrying viscosity increasing agent.

14. An approved pharmaceutical composition comprising a pharmaceutically acceptable viscosity increasing agent, and a pharmaceutically

acceptable carrier, wherein said composition has a viscosity of between 4 and 20 centipoise and is suitable for injection into the bloodstream of a mammal.

15. The composition of claim 13, wherein said viscosity –increasing agent comprises a PEG-dextran conjugate.

16. The composition of claim 15, wherein the PEG portion of said PEG-dextran conjugate has an average molecular weight of between 1,000 and 40,000 daltons.

17. The composition of claim 14, wherein said composition is approved for injection into humans.

18. The composition of claim 14, wherein said composition is approved for veterinary use for injection into a mammal selected from the group consisting of dogs, cats, sheep, swine, bovines, horses, chimpanzees, monkeys, and apes.

19. A method for determining the amount of a viscosity-increasing agent for administration to a mammal, whereby microvascular circulation is increased or maintained, comprising calculating the amount of a selected viscosity-increasing agent solution which will produce a desired plasma viscosity in a patient.

20. The method of claim 19, further comprising selecting an individual for administration of the solution, wherein said individual suffers from or is at risk of hemodilution sufficient to impair microvascular function in the absence of a transfusion or administration of a viscosity-increasing agent solution.

21. A method for enhancing the biological function of a hemoglobin-based artificial blood product or plasma expander that provides insufficient viscosity

to maintain sufficient wall shear stress, comprising administering to a patient a non-oxygen-carrying viscosity increasing agent in conjunction with said hemoglobin-based artificial blood product or plasma expander in an amount sufficient to elevate plasma viscosity sufficiently to maintain functional capillary density in a mammalian patient at least 40% of normal.

22. A packaged solution comprising an approved viscosity-increasing agent, wherein said solution is sterile and is in a container suitable for administration of said solution to a patient, and wherein said solution has a viscosity of at least 4.0 cp.

23. The packaged solution of claim 22, wherein said container is a single use container containing from 100 to 700 ml of said solution.

24. A method for monitoring the clinical condition or stability of a patient or the need for a transfusion comprising determining the viscosity of the patient's blood or plasma.

25. The method of claim 24, further comprising determining the hemoglobin concentration or hematocrit of said patient as a measure of the oxygen carrying capacity of the blood of said patient.